

5 **We claim:**

1. A method that gives the perception of a display with a full range of color from a matrix of optical elements of a first or a second color, comprising

 providing a two-color display of optical elements of a first color and a second color and being arranged in an alternating pattern,

10 determining, for an image presented on a full color display, the relative brightness for points of the image produced by the full color display, and

 translating the relative brightness of the points created by the full color display into a corresponding brightness for the respective points on the two-color display.

15 2. A method according to claim 1, wherein the step of translating includes mapping a three dimensional coordinate representative of the relative brightness of a point to a two dimensional point.

20 3. A method according to claim 1, including generating a flashing period representative of a timing pattern for flashing the two-color display.

25 4. A method according to claim 1, wherein flashing the two-color display includes alternating the display at the flashing period between the image presented in the first and the second color.

5. A method according to claim 4, including varying the flashing period.

30 6. A method according to claim 1, wherein the step of translating includes translating the relative brightnesses of a point in a red-green-blue image to a relative brightnesses of a two-dimensional point of the first and the second color.

7. A method according to claim 1, wherein the full color display includes red, green and blue emitters, and wherein the step of translating includes

- 5 summing the brightness for a three color red element with half the brightness of the three
color green emitter to determine the relative brightness for the two-color first color emitter, and
 summing the brightness for a three color blue elements with half the brightness of the
three color green emitter to determine the relative brightness for the two-color second color
emitter.
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8. A method according to claim 7, including generating a noise signal, and
 summing the noise signal with the relative brightness for the two-color of the first and/or
the second color emitter.
- 15 9. A method according to claim 1, including the further step of providing a video driver for
driving a video display as a function of the translated relative brightness of points for a two-color
display.
- 20 10. A method according to claim 1, wherein the optical elements comprise light emitting
diodes.
- 25 11. A method according to claim 1, wherein the optical elements comprise filters.
- 30 12. A method for creating the perception of a display with a full range of colors from a matrix
of optical elements of a first or a second color, comprising
 providing a two-color display of optical elements of a first and a second color arranged in
an alternating pattern,
 determining for an image presented on a three color display, the relative brightness for
each point of the image produced by the three color display,
 translating the relative brightness of each point created by the three color display into a
corresponding brightness for the respective points on the two-color display, and
 sequentially activating optical elements of the first and the second color, for simulating the effect
of a full color display.

- 5 13. An apparatus for visually displaying information on a two-color display, comprising
a display having two-color elements,
a memory device for storing information representative of a plurality of points for making
up the image, each point being associated with information representative of three color
components, and
- 10 a process for translating the relative brightness of the three color components to relative
brightness levels for the two-color elements of the display.
14. An apparatus according to claim 13, further comprising a server system for executing the
translation process and for delivering to the display having two color elements information
15 representative of an image.
15. An apparatus according to claim 13, further including
a timer for periodically flashing the display.
- 20 16. An apparatus according to claim 13, further including
a noise generator for generating a noise signal having two-color components and for
delivering the noise signal to the video driver process for processing the noise signal with the
three color components of the image.
- 25 17. An apparatus according to claim 16 including a dynamically changing filter for
introducing variation into the translation of the relative brightness of the three color components
to relative brightness for the two-color elements.
18. An apparatus according to claim 13, wherein the process includes
30 a process for summing the brightness for a first one of the three color components
with half the brightness of a second one of the three color components to determine the relative
brightness for a first color component of the display, and

5 summing the brightness for a third color component with half the brightness of the
second color component to determine the relative brightness for the second color component of
the display.

19. An apparatus according to claim 13, wherein the process includes
10 a process for determining the long wavelength component of a two color display by
multiplying the number s representative of relative brightness of three colors in a three color
display by values representative of the effect of a longwave pass filter, and summing the
generated numbers to provide the relative brightness of that point in the long wave component of
the two color display, and
15 a process for determining the short wavelength component of a two color display by
multiplying the number s representative of relative brightness of three colors in a three color
display by values representative of the effect of a shortwave pass filter, and summing the
generated numbers to provide the relative brightness of that point in the short wave component of
the two color display.

20. An apparatus according to claim 13, further comprising a border having a color that is the
combination of the first and the second colors or the two color display and being arranged
substantially around the periphery of the display.

21. An apparatus to claim 20, wherein the border comprises part of the image displayed to the
user.

22. An apparatus according to claim 20, wherein the border comprises colored border formed
as an edge around the two-color display.

23. An apparatus according to claim 20, wherein the border comprises a yellow border of
spectral yellow or yellow formed from red-green components.

- 5 24. An apparatus according to claim 13, wherein the two-color display include a display selected from the group consisting of an LED display, and LCD display, a light emitting polymer display and a CRT display.

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